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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MCDONALD, RODNEY GLENN	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
11/03/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/562,451	BAUBET ET AL.	
	Examiner	Art Unit	
	Rodney G. McDonald	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 23-33* is/are pending in the application.

4a) Of the above claim(s) *1-18 and 31-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-21 and 23-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 13, 2009 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 19-21, 24-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. (U.S. Pat. 5,569,362) in view of Scobey et al. (U.S. Pat. 4,851,095) and Nakanishi et al. (U.S. Pat. 6,033,471) or Veerasamy (U.S. Pat. 6,596,399).

Regarding claim 19, Lerbet et al. teach a process for depositing one layer on a substrate in a sputtering chamber comprising a sputtering system comprising a target, a linear ion source, and a conveying system. The process comprises depositing at least one dielectric film layer on the substrate by sputtering with the sputtering system comprising the target, generating at least one ion beam coming from an ion source in the sputtering chamber in the presence of the sputtering system comprising the target and wherein the refractive index of the dielectric layer exposed to the ion beam can be adjusted to parameters of the ion source. (Column 2 lines 13-20; Column 5 lines 25-48; Column 2 lines 50-51; Column 4 lines 3-25; Fig. 5) The substrate can be conveyed through the sputtering chamber in a linear successive horizontal manner. (Column 4 lines 3- 25 esp. lines 15-20) Lerbet et al. teach the density of the dielectric layer is preserved. (Column 2 lines 49-48)

Regarding claim 20, Lerbet et al. an oxygen ion beam is created. (Column 5 lines 35-40; Column 3 lines 44-50)

Regarding claim 21, Lerbet al. teach the energy of the ion beam can be less than or equal to 500 eV. (Column 3 lines 58-62)

Regarding claim 24, Lerbet et al. teach the refractive index of the dielectric layer is increased. (Column 2 lines 50-51)

Regarding claim 25, Lerbet et al. teach the exposure to an ion beam takes place simultaneously with the deposition of the layer by sputtering. (Column 3 lines 4-5)

Regarding claim 26, Lerbet et al. teach the exposure to an ion beam takes place sequentially after the layer has been deposited by sputtering. (Column 3 lines 18-20)

Regarding claim 27, Lerbet et al. teach directing the ion beam onto the substrate. (Column 5 lines 25-49)

Regarding claim 29, Lerbet et al. teach the dielectric layer can be zinc oxide. (Column 4 line 1)

The difference between Lerbet al. and the present claims is that the ion beam being created by a linear ion source is not discussed (Claim 19) and the parameters of the ion source are modification of the angle between the ion beam and the surface of the substrate and/or modification of the voltage applied to the ionic source (Claim 19).

Regarding the use of a linear ion source (claim 19), Scobey et al. teach utilizing a linear ion source for sequentially deposition and treating of substrates. (See Abstract; Column 8 lines 34-68; Column 9 lines 1-68; Column 10 lines 1-2)

The motivation for utilizing a linear ion source is that it allows upward scaling capability. (Column 9 lines 64-65)

Regarding the parameters of the ion source being modification of the angle between the ion beam and the surface of the substrate (Claim 19), Nakanishi et al. teach that the angle of the assist ion beam should be from 0 to 45 degrees. (Column 3 lines 15-20)

The motivation for utilizing the features of Nakanishi et al. is that it allows providing enough energy for the ions to bombard the atoms of the thin film. (Column 3 lines 15-20)

Regarding the parameters of the ion source being the modification of the voltage applied to the ion source (Claim 19), Veerasamy teaches controlling the voltage of a linear ion source to control the energies of the ions eV. The energies of the ions eV is about 1/2 the Voltage. (Column 6 lines 4-25)

The motivation for utilizing the features of Veerasamy is that it allows for controlling properties of the film. (Column 4 lines 52-57)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Lerbet et al. by utilizing the features of Scobey et al. and the features of Nakanishi et al. or Veerasamy because it allows for upward scaling capability, controlling the energy bombarding the films and for controlling the properties of the films.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. in view of Scobey et al. and Nakanishi et al. or Veerasamy as applied to claims 19-21, 24-27 and 29 above, and further in view of Gregory et al. (U.S. Pat. 4,691,077).

The difference not yet discussed is the lowering of the index of refraction by exposure to an ion beam. (Claim 23)

Regarding claim 23, Gregory et al. teach lowering the refractive index by ion beam treating according to selection of the ion gas. (Column 2 lines 5-15)

The motivation for lowering the refractive index is that it allows for control of the index of refraction. (Column 2 lines 5-15)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Gregory et al. because it allows for control of the index of refraction.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. in view of Scobey et al. and Nakanishi et al. or Veerasamy as applied to claims 19-21, 24-27 and 29 above, and further in view of Wei (U.S. Pat. 6,190,511).

The difference not yet discussed is directing an ion beam onto at least one of the cathodes. (Claim 28)

Regarding claim 28, Wei teaches directing an ion beam onto a target cathode of a sputtering cathode. (Column 4 lines 11-28) An assist ion beam can treat the coated substrate. (Column 6 lines 15-17)

The motivation for directing an ion beam onto at least one cathode is that it allows for sputtering of the cathode. (Column 4 lines 11-18)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Wei because it allows for sputtering the cathode.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. in view of Scobey et al. and Nakanishi et al. or Veerasamy as applied to claims 19-21, 24-27 and 29 above, and further in view of Reade et al. (U.S. Pat. 6,809,066).

The difference not yet discussed is that treating the deposited layer with an additional treatment with at least one other ion beam is not discussed (Claim 30).

Regarding claim 30, Reade et al. teach depositing a buffer layer by utilizing ion beam assisted deposition. (Column 3 lines 13-19) The buffer layer deposition can occur by sputtering. (Column 14 lines 15-19) The buffer layer can be MgO. (Column 12 lines 61-62) The buffer layer can then be textured by ion beams. (Column 3 lines 36-46) Multiple beams can be used in sequence for the texturing. (Column 4 lines 5-10)

The motivation for performing an additional ion beam treatment step is that it allows for increasing the degree of texture of the surface. (Column 3 line 40)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Reade et al. because it allows for increasing the degree of texture for the surface.

Response to Arguments

Applicant's arguments filed October 13, 2009 have been fully considered but they are not persuasive.

In response to the argument that Lerbet's process results in an inferior layer as compared to the present claims, it is argued that Lerbet's process will result in a layer with controlled refractive index which is precisely what Applicant desires to achieve. (See Lerbet Column 2 lines 50-51)

In response to the argument that one of ordinary skill in the art would not look at Lerbet's limited R&D technique in order to achieve industrial scale processes, it is

argued that Applicant's claims do not require industrial scale manufacture. However one of ordinary skill in the art would readily scale up from an R&D level to industrial scale to achieve more throughput.

In response to the argument that Lerbet does not recognize that ionic source parameters can be modified to adjust the refractive index of the dielectric layer, it is argued that Lerbet et al. teach changing the refractive index of a layer by selecting the eV of an ion beam. Lerbet et al. show the treatment occurring in a single chamber. Lerbet et al. select the eV to be less than or equal to 500 eV. (See Lerbet et al. Example 1; Fig. 5 ; Lerbet et al. discussed above) Veerasamy teaches that the eV of an ion beam is related to the applied voltage. (See Veerasamy discussed above) Therefore one of ordinary skill in the art would readily envisage controlling the voltage of the ion beam source to control the eV of the ions which directly affect the refractive index of the deposited layers. Furthermore, Nakanishi et al. suggest controlling the angle of the ion beam to control the energy of the bombarding ions and as shown by Lerbet the energy of the bombarding ions controls the refractive index. (See Nakanishi et al. discussed above)

In response to the argument that Scobey does not recognize that the angle between the ion beam and the surface of the substrate or the applied voltage effect the refractive index of the deposited layer, it is argued that the other applied references were relied on to teach these limitations of the claims.

In response to the argument that Nakanishi and Veerasamy does not recognize that the angle between the ion beam and the surface of the substrate or the applied

voltage effect the refractive index of the deposited layer, it is argued that Lerbet et al. teach changing the refractive index of a layer by selecting the eV of an ion beam. Lerbet et al. show the treatment occurring in a single chamber. Lerbet et al. select the eV to be less than or equal to 500 eV. (See Lerbet et al. Example 1; Fig. 5 ; Lerbet et al. discussed above) Veerasamy teaches that the eV of an ion beam is related to the applied voltage. (See Veerasamy discussed above) Therefore one of ordinary skill in the art would readily envisage controlling the voltage of the ion beam source to control the eV of the ions which directly controls the refractive index of the deposited layers. Furthermore, Nakanishi et al. suggest controlling the angle of the ion beam to control the energy of the bombarding ions and as shown by Lerbet the energy of the bombarding ions controls the refractive index. (See Nakanishi et al. discussed above)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
October 27, 2009